

Summer Travels:

The summer schedule looked a bit daunting. There were dates on the calendar that represented long anticipated family benchmarks that would be celebrated - including my son's college graduation and my oldest daughter's wedding! There was also the long-delayed ASTM International's triennial Johnson Rook Conference in Burlington Vermont – finally approaching the last week in July. And then, without much time to be back home, out the door again to fulfill a previous invitation to run workshops in Pittsburgh and Cincinnati the first week in August.

Wait, how much per gallon?

There were many trips back and forth from University of Delaware cleaning out my son's off-campus house and subsequently filling my garage in Bucks County Pennsylvania with all of his college possessions. Likewise, the youngest daughter had to be moved from Ithaca College in NY back home. All of this with gas prices creeping up, up, and up. Fortunately, for the first time in thirty years, I took Amtrak to the ASTM Conference in Burlington. That six-state trip was followed by the trip through PA, into OH, past WV, and eventually into KY. Ten states in about ten days.

Yet, all worth it to commune with old colleagues and new made professional friends at MSHA and NIOSH and see the beautiful mountains of West Virginia.



this issue

MSHA and NIOSH Workshops **P.1**

Mold Awareness Month **P.2**

Nephrite/Jade/Tremolite Part 2 **P.3**

The Latest: News and Updates **P.4**

iATL Road Trip: MSHA and NIOSH Workshops

A conference call at the beginning of covid involving MSHA and OSHA SLC colleagues over an odd population of minerals detected out West later developed into an invitation to host workshops at MSHA offices outside Pittsburgh PA. Those plans took a back seat to the covid pandemic restriction on visiting.

Lab Visits

iATL has been privileged to be the contract laboratory for MSHA for nearly a decade. The work normally covers routine analytical services involving asbestos in various airborne, bulk building materials, and dust. The more investigative samples of soil, ores, and NOA are often in collaboration of the OSHA Salt Lake City laboratory colleagues of Dan Crane and Don Halterman. These provide out-of-the-routine opportunities into the exotic for staff and management.

Following up on the latter challenges has bred a thirst for an expanded understanding from MSHA that these opportunities represent and the analytical solutions currently in place, and/or in the standards pipeline. As such, Matt Fenlock and his staff at MSHA initiated the idea of a workshop.

The iATL Laboratory Director had pre-covid, facilitated a series of workshops in the Fall of 2019 for the Australian and New Zealand regulators, academics, engineering, consultants, remediation groups, health and safety officials, and laboratories. This would be closer to home and an opportunity to take an even deeper dive into some of the issues at hand with professionals who knew and understood the foundational concepts.

The MSHA and subsequent NIOSH Lab visits were

conveniently planned after the ASTM International Johnson/Rook Conference as many of the scientists on staff at MSHA and NIOSH could not attend the conference due to lingering travel and health restrictions. So, two birds with one stone – a summary of the five-day conference and its issues and topics, as well as news from ASTM and ISO on the methods, practices, guidance documents, and research in play and in the works.

The **MSHA Pittsburgh** visit featured topics centered around NOA and soil as well as advanced discussions on some of the more exotic challenges like erionite, talc deposits, and new analytical methods. It was uplifting to tour the state-of-the art AIHA LAP accredited labs at MSHA. Their staff and dedication to quality was apparent. This was underscored by the live and virtual audience of nearly twenty that participated in the almost four-hour workshop.

The **NIOSH Cincinnati** visit featured slightly different targeted subjects and issues involving new analytical technologies, elongated mineral particles (EMPs), nomenclature, occupational case studies, as well as news on NIOSH 7402 revisions, and a revisit to real-time analyzer follies from the past. A live and virtual audience asked pertinent questions at this workshop.

A special thanks to Matt Fenlock, Chris Findlay, Christina Stalnaker, Pramod Kulkarni, Alan Dozier, and Matt Leitzinger for your hospitality!

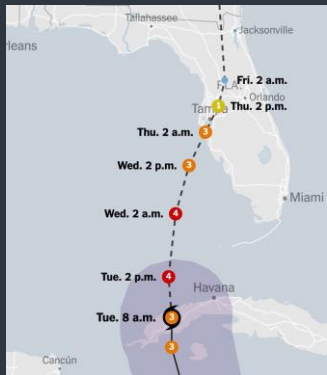
iATL Workshops available
by contacting
CustomerService@iatl.com

Context:

Hurricane Ian is streaming up the Gulf Coast. The Category 4 storm hit Cuba and is on its way to the west coast of Florida.



Every year parts of the US are ravaged by these intense storms that bring ruinous winds and rain and tropical laden humid air for days. This is the recipe for fungal spore growth in the outside environment – and when that basement floods or that roof is damaged and the rains soak the interior, the perfect growth media.



Since Hurricane Katrina in 2005, iATL has been on the front lines of property damage investigations with government, insurance, and property owner projects. Yes, mold is everywhere, but the mold damage is a symptom that can be remediated after human rescue and recovery.

MOLD AWARENESS MONTH:

iATL engaged Dr. John Shane from the infamous McCrone Research Institute in 2004 to run a two-week course of fungal spore growth, viable culture techniques, direct and indirect analytical methods, and the identification and classification of hundreds of genera. Four iATL staff attended that two-week course. The rest is history.

Mold Awareness

The US EPA has dedicated September as Mold Awareness Month. EPA and other government health and environmental [websites](#) have abundant resources for building owners and the public to learn more about mold and its place in our built environment.

The Basics

Mold is an essential part of our planet's ecosystem. Their growth cycle includes the development of seed-like spores when the conditions of moisture and abundant food sources are present. Then root-like rhizomes called hyphae grow and form spore-bearing appendages that, when mature, release thousands of spores into the environment. When that environment is your mulch pile then the breakdown of that food

source commences. When the fungal spore release extends to your wet basement or between your sheetrock constructed walls – well, not something that you anticipated dealing with as a homeowner, or school principal, or hospital operating room surgeon, or clean room engineer.

The basics – mold in the built environment is a symptom, not of the ubiquitous mold genera and species present, but of wet food sources that will trigger growth.

Mold Toxins

Some molds can produce mycotoxins, the mention of which can cause alarm. However, most studies indicate human allergic reactions to molds are mainly caused by mold glucan (spore cell walls), not mycotoxins. Furthermore, the types of molds producing mycotoxins are not commonly associated with indoor buildings, but rather in the agriculture industry.

Mold spores can be viable (able to reproduce), under favorable growth conditions, or non-viable (not able to reproduce), due to less favorable conditions. Both viable and non-viable spores retain their allergenic components (glucan), causing the same allergic reactions.

The absence of mold spores in the air does not definitively mean a space is "clean". Likewise, the presence of a few spores does not imply a space is "contaminated". Mold is everywhere.

Air sampling for mold spores only provides a "snapshot" in time of the highly variable mold spore presence, as sampling is generally done for only 5-10 minutes.

Air sampling results for mold spore concentration are extremely variable. A great deal of caution should be used to interpret the results. Lab reports are not definitive of a particular plan of remediation, but rather serve as supporting evidence to identify the severity and source of the mold growth indoors.

Indoor and outdoor comparisons of mold spore identification and concentration may be useful. If the outdoor air has a high loading of spores of a particular type, the indoor air may also have a fraction of the concentration of the same spore type.

There are no nationally or locally recognized mold spore concentration thresholds codified. As such, any laboratory results used out of the context of a well-designed and executed sampling plan may not be useful.

Optical microscopy (ASTM method D7391) is used to determine the identity and concentration of mold spores in the air. This provides a quantitative (how much) and qualitative (what kinds) result.

Accreditation and QA at iATL

Interested parties may request a copy of iATL's Technical Bulletin on Mold Issues and a copy of our AIHA LAP EMLAP accreditation – please contact CustomerService@iatl.com.

This Month's Q&A...

Q: My Mold Analytical Report lists 'Black Mold' – when will I turn into a zombie and be among the undead?

A: While theoretically a single asbestos fiber exposure could cause disease – it is improbable to the extreme. Decades of industrial hygiene research continue to underscore (i) the complexity of environmental and occupational exposures, (ii) the role of duration, dose, frequency, (iv) the role of specific hazard particle properties, and (v) the myriad factors of human resistance or immuno-compromise.

Mold exposure is not much different. What is the environment (someone living or visiting a basement)? What is the duration (8 hours a day in that unventilated interior location or just visiting for a few minutes)? How frequently am I in that environment? What is the dose (airborne samples reveal what concentration compared to ambient outside concentrations)? What specific fungal genera were identified? Are you a young child or elderly or a recent cancer survivor? It's complicated.

There are many types of black mold. *Stachybotrys* is usually the one referred to as "toxic mold". All molds can cause symptoms in people who are sensitive to or allergic to mold. But there is no reason to believe that black mold is any more dangerous than other types or colors of mold. It sometimes produces toxic chemicals that are found in its airborne spores and fungus fragments. These are called mycotoxins and are dangerous if they're eaten. There's no link to inhaled *stachybotrys* mycotoxins and deadly diseases. But there are risks for people with allergies, asthma, and other hypersensitivities. Is that black stuff on my basement wall mildew or mold or water scale? That's why we test in an accredited laboratory.



"Nephrite Ornament," boy on a buffalo, Qing Dynasty, China, by Pascal3012. Licensed under CC-BY-SA 3.0.

Typical historical, cultural, and contemporary art jewelry uses of nephrite. See also [Gems Society](#)

Mineral Exposure Study

Part 2 Continued from Next Level Issue 2022 07.

Republished in 2022 after initial publication in 2013, Dr. Yang and his colleagues at the Department of Occupational Medicine, Buddhist Tzu Chi Hospital, in Taiwan worked with iATL from 2009-2016. iATL provided a full array of mineral characterization services from XRD, PLM, and TEM (EDS/SAED) on various amphiboles, pyroxenes, and serpentine minerals. The study is listed as "[Carving of Non-asbestiform Tremolite and the Risk of Lung Cancer: a follow-up Mortality Study in a Historical Nephrite Processing Cohort](#)" (DOI Listing Below). The study looked at the history of stone carving and the occupational exposures to tremolite and a range of similar polymorphs such as nephrite.

Mineral Composition

Nephrite is a non-asbestiform amphibole related closely to tremolite or actinolite. Like many minerals, swap out some of the cations in slightly different ratios, and things like color, crystalline lattice structure, fibrous growth habit, and toxicity may change. This is why careful laboratory classification was required. The data below underscores the concerns. iATL submitted over a hundred images and data sets.

Here's some examples:

(a) stereoscopic image of typical greenish rock with inclusions of white, yellow, black.

(b) tremolite showing fibrous growth PLM/CSDS.

(c) TEM images of asbestiform and non-asbestiform habit growth. (20kx)

(d) EDS data, initial chemical profile

(e) Airborne PCM and TEM data

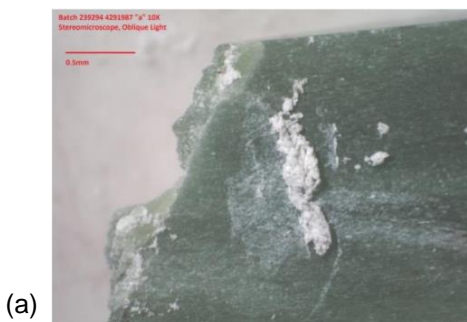


Figure 1. Sample "a", 10X, stereomicroscope.

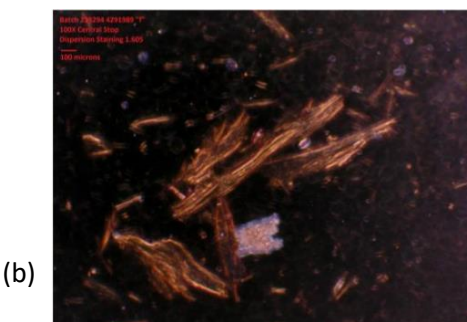
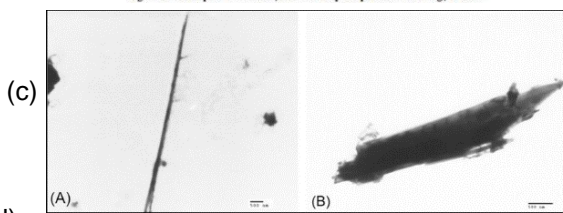


Figure 9. Sample "f", 100X, central stop dispersion staining, 1.605.



	1	2	3	4	5	6	7	Averages	SD					
	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile
Mg	34.8	0.55	35.3	0.56	35.7	0.57	36.1	0.58	36.2	0.58	35.3	0.56	35.9	0.58
Al	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Si	63.8	1.00	63.4	1.00	63.1	1.00	62.7	1.00	62.6	1.00	63.4	1.00	62.3	1.00
Ca	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Fe	1.4	0.02	1.3	0.02	1.2	0.02	1.2	0.02	1.2	0.02	1.3	0.02	1.1	0.02

NIST Tremolite											Averages	SD						
	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile	WT%	Profile
Mg	22.9	0.37	22.6	0.36	21.8	0.35	19.5	0.32	19.3	0.31	23.9	0.39	21.9	0.35				
Al	0.0	0.00	0.0	0.00	0.0	0.00	4.0	0.07	2.8	0.04	0.0	0.00	0.6	0.01				
Si	61.6	1.00	62.2	1.00	62.2	1.00	60.3	1.00	61.8	1.00	60.9	1.00	61.8	1.00				
Ca	14.9	0.24	13.6	0.22	14.9	0.24	15.4	0.25	14.5	0.23	13.8	0.23	14.7	0.24				
Fe	0.5	0.01	1.7	0.03	1.1	0.02	0.8	0.01	1.6	0.03	1.4	0.02	1.1	0.02				

Mg	Al	Si	Ca	Fe
0.6	0.0	1.0	0.0	0.0
% Diff from NIST Standard				
60.5%	n/a**	0.0%	n/a**	n/a**

NIST Tremolite Profile (Averaged)				
Mg	Al	Si	Ca	Fe
0.4	0.0	1.0	0.2	0.0

** Averaged profile values <0.1 were not considered significant and ignored.

Table 2 Asbestos fibre concentrations at a nephrite processing factory analysed by PCM and TEM

Location	Procedure	Sample time (min)	Air volume (L)	Concentration (f/cm ³)			Asbestos type
				PCM	TEM Length ≥ 0.5 μm	TEM Length ≥ 5 μm	
Worker	Cutting	20	60.084	0.44	12.1	1.0	Tremolite, actinolite
	Rough grinding	20	60.084	4.70	24	2.9	Tremolite, actinolite
	Fine grinding	20	60.084	0.18	0.098	0.05	Tremolite
	Polishing	16.1	48.368	<0.059	<0.062	<0.062	None detected
Environment	Ambient air	76	225.963	0.11	2.1	0.34	Tremolite

(e) The samples are grouped by location and procedure. PCM, phase contrast microscopy; TEM, transmission electron microscopy.

Hsiao-Yu Yang, M.D., MSc., Ph.D., Dr Pau-Chung Chen, Institute of Occupational Medicine and Industrial Hygiene, National Taiwan University College of Public Health, No. 17 Xuzhou Road, Taipei 100, Taiwan; pchen@ntu.edu.tw Yang H-Y, et al. Occup Environ Med 2013;70:852-857. doi:10.1136/oemed-2013-101404

EYE ON IT

Asbestos Denaturing

Keep your eye on Next Level as we will feature a series of articles on this growing subject. While many private and public studies and larger scale project trials were conducted in the US within the last 30 years – this subject is gaining momentum in Europe and beyond as possible solutions to growing asbestos issues around destruction, transformation, and recycling. iATL played a key role in four studies in the US. See next issues!

iATL Customer Resources

Because you asked...

Data interpretation and summary USEPA's Toxicity Characterization Leachate Program (TCLP) including sample collection, two-tiered laboratory preparations, analysis, data reports, and MCL's. Ask CustomerService@iatl.com



Professional Development

Is it time to increase your understanding and awareness of some nuanced technical issues? email info@iatl.com.

2022 iATL Online Workshops

iATL Laboratory Director and noted speaker and presenter, Frank Ehrenfeld, will reprise many recent workshop-style presentations for our clients throughout 2022. Expect registration news in coming weeks for March, May, July, September, and November offerings. Topics may include:

- Asbestos and Talc Issues
- Erionite and other EMPs
- Natural Occurrences of Asbestos (NOA) – Evolving International Solutions
- Analytical Methods for Asbestos & International Advances
- WTC 9/11, 20 Years Later Lessons Learned
- Asbestos in Dust - Updates
- Asbestos in Water – What's New
- In situ Asbestos Analyzers
- Asbestos Disease Med Updates
- Vermiculite Method News
- Asbestos Work Practice Studies
- Asbestos in New Building Mat'ls
- Asbestos Vitrification – Updates
- Artificial Intelligence (AI) and Asbestos Analysis Progress
- eLearning through ASTM Int'l
- Combustion By-Product Analysis: Fire, Insurance, and Forensics

Registration for November 15, 2022, Webinar available here.

[Register](#)

Recent Validation Study in situ
Real Time Asbestos Analysis for
Fenceline Monitoring

NEXT LEVEL

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Mention this Newsletter Issue and receive 5% off your next sample submittal

iATL is celebrating the **US EPA's Mold Awareness Month** for September. Yet, the month is waning so we will extend this mold sales promotion through October!! iATL has been an AIHA EMLAB accredited laboratory since 2005. That recognition; credibility and competency. That many years; continuity. Our ability to provide timely analysis; capacity and customer service. Save 30% on Mold air samples from now through October 31 2022! Here's how:

- Click here to register once and you will automatically receive a 30% discount on all mold air samples received during the promotion period.**
- Alternatively, you can include a copy of this email or reference Mold Awareness Sale on your COC.
- Ask also about our [Technical Bulletin No. 17](#) - Mold / Fungal Spore Samples Q&A and receive your first sample free.

Contact our Customer Service representatives (CustomerService@iatl.com or 856-231-9449) and let them know you want your Mold Awareness Month discount!

**Account must be in good standing (no invoices more than 30 days past due) at the time samples are received in order to qualify for the promotion. iATL reserves the right to change or discontinue this promotion at any time.

Next Level

BECAUSE YOU ASKED...

Respirable Crystalline Silica (RCS) pump and sampling equipment rental availability. Contact CustomerService@iatl.com



iATL Customer Service Contacts:

Need assistance with questions on upcoming projects, or information on samples in the laboratory? Get answers from staff during normal business hours – or contact us...

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Ask us about iATL's interactive LIMS Database, **iTRACC** Client Portal - for your devices - for your convenience

Upcoming Events

- ASTM Int'l Symposium: [DLs for Air Quality](#)
Oct 19-21, 2022 New Orleans LA
- AIHA's Annual Conference: [AIHce 2023](#)
May 20-25, 2023 Phoenix AZ
- American Env & Eng Geologists: [AEG 2023](#)
Oct 19-21, 2022 New Orleans LA
- Geological Society of America: [GSA 2023](#)
Oct 15-18, 2023 Pittsburgh PA

Next Issues for Next Level

- Asbestos Vitrification Part 1
- Silica Analysis Data Interpretation
- States expand lead (Pb) regs
- International Analytical method Development (ISO and ASTM news)

[Link to archived Next Level issues](#)